

Purchasing a Home versus Renting and Investing

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Buying a home is typically the largest investment a household makes. One alternative is to rent a home and invest any savings from renting in something else. From purely an investment perspective, the anticipated rate of return plays a crucial role in the homebuying decision. This report compares the financial gains from renting and investing any remaining cash in the stock market with the gains from purchasing a home. Households faced with such a choice should consider the historic performance of both before making their choice.

The point of initial investment ranges from the beginning of 2000 to the beginning of 2016, a period with significant disruptions in both the stock and housing markets.

Multiple investment opportunities are available to households. However, stocks and real estate have shown to be two of the more popular. According to the Survey of Consumer Finances (conducted by the Federal Reserve Bank), 63.7 percent of all families in the United States held a primary residence in 2016, while 51.9 percent of all families had direct or indirect stock holdings.

Although the proportion of families who held a primary residence was somewhat similar to the proportion of families with direct or indirect stock holdings, the values of the assets differed significantly. In 2016, the median value of stocks for families with direct or indirect stock holdings was \$40,000, whereas the median home value was almost five times that at \$185,000. Note, however, that the amount of actual home equity is affected by any remaining mortgage balance, assuming the home is mortgaged at all.

By renting and investing in a stock portfolio, the household forgoes the potential to earn appreciation from homeownership but may benefit from selling the stock at a profit. Conversely, by purchasing a home, the household forgoes the future earnings from a stock portfolio as well as the potential to earn dividends. Renting can cost more than homeownership, in which case a renter household might not be able to invest any excess funds in a stock portfolio.

The question is, if between 2000 and 2016 a Texas household had the option of either renting (and consequently investing in the stock market) or purchasing a

home, which provided the greater financial gain? The answer isn't simple.

Scenario 1: Stocks versus Homes

Numerous differences complicate a comparison between renting and investing in the stock market and purchasing a home. The Real Estate Center's analysis attempted to control for the differences through a number of initial assumptions in this first scenario. (The assumptions are expanded in a second, more complex scenario later in this report.)

- The household either purchases a home or rents and invests the entire down payment in a stock portfolio at the beginning of the year.
- In the case of a home purchase, the household meets the qualifying requirements for purchasing a home.
- In the case of an investment in stocks, the household does not trade any stocks during the holding period and reinvests all dividends (a buy-and-hold investment strategy).
- The household does not face any constraints in the sale of either the stock portfolio or the home.
- The internal rate of return (IRR) results are the sole criteria for buying versus renting (see "Using IRR as a Benchmark"). The analysis does not account for qualitative differences between owning and renting.

- Households seek a longer-term investment in a primary residence. Second home or investment property purchases are not considered.

Under this first scenario, assume a household with \$10,000 has two options: rent and open an investment portfolio or spend the money on a down payment on a home. For this initial analysis, the home price is assumed to be \$100,000, resulting in a loan-to-value (LTV) ratio of 90 percent.

Investment Portfolio

The value of the investment portfolio at the end of each year, after a minimum two-year hold, depends on the year the \$10,000 was invested (Table 1). Table 2 depicts the IRR on the initial investment based on the year in which the portfolio is liquidated.

The timing of the initial investment, the duration of the holding period, and the volatility in the stock market during the holding period produce dramatically different returns. In general, opening a portfolio in a year with strong stock market returns produces a higher initial IRR due to the positive impact of compounding in the early years.

For example, a portfolio opened in the beginning of 2003 earned an average IRR of +12.7 percent after five years (at the end of 2007). The high return stems from the large initial upswing in the market in the first two years (+19.2 percent) as well as strong average IRRs across the later holding periods, ranging from +12.7 to

Table 1. Value of Initial \$10,000 S&P 500 Stock Portfolio at Year-End

Year of Initial Investment (Beg. of Year)	In Dollars																
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
2000	8,019	6,257	8,032	8,895	9,325	10,780	11,372	7,215	9,086	10,433	10,652	12,345	16,313	18,519	18,774	20,985	25,526
2001		6,879	8,829	9,778	10,250	11,851	12,501	7,931	9,988	11,469	11,710	13,570	17,932	20,358	20,638	23,068	28,060
2002			10,016	11,092	11,628	13,444	14,181	8,998	11,331	13,011	13,284	15,394	20,343	23,094	23,413	26,169	31,832
2003				14,214	14,902	17,228	18,173	11,530	14,521	16,673	17,023	19,728	26,069	29,595	30,003	33,536	40,793
2004					11,610	13,422	14,158	8,983	11,313	12,990	13,262	15,370	20,310	23,057	23,375	26,127	31,781
2005						12,120	12,785	8,112	10,216	11,730	11,976	13,879	18,340	20,820	21,108	23,593	28,698
2006							12,195	7,738	9,744	11,189	11,423	13,239	17,494	19,860	20,134	22,505	27,375
2007								6,693	8,429	9,678	9,881	11,451	15,132	17,178	17,415	19,466	23,678
2008									7,990	9,175	9,367	10,856	14,345	16,285	16,510	18,453	22,447
2009										14,460	14,763	17,109	22,609	25,667	26,021	29,084	35,379
2010											11,723	13,586	17,953	20,381	20,662	23,095	28,093
2011												11,832	15,636	17,750	17,995	20,114	24,467
2012													15,314	17,386	17,625	19,700	23,964
2013														15,002	15,209	16,999	20,678
2014															11,509	12,864	15,648
2015																11,331	13,784
2016																	13,596

Sources: Real Estate Center at Texas A&M University and Dr. Aswarth Damodaran (New York University)

Table 2. IRR from S&P 500 Stock Portfolio at Year-End

Year of Initial Investment (Beg. of Year)	Percent																
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
2000	-10.5	-14.5	-5.3	-2.3	-1.2	1.1	1.6	-3.6	-1.0	0.4	0.5	1.6	3.6	4.2	4.0	4.5	5.3
2001		-17.1	-4.1	-0.6	0.5	2.9	3.2	-2.9	0.0	1.4	1.4	2.6	4.6	5.2	4.9	5.4	6.3
2002			0.1	3.5	3.8	6.1	6.0	-1.5	1.6	3.0	2.9	4.0	6.1	6.7	6.3	6.6	7.5
2003				19.2	14.2	14.6	12.7	2.4	5.5	6.6	6.1	7.0	9.1	9.5	8.8	9.0	9.8
2004					7.7	10.3	9.1	-2.1	2.1	3.8	3.6	4.9	7.3	7.9	7.3	7.7	8.6
2005						10.1	8.5	-5.1	0.4	2.7	2.6	4.2	7.0	7.6	7.0	7.4	8.4
2006							10.4	-8.2	-0.6	2.3	2.2	4.1	7.2	7.9	7.2	7.7	8.8
2007								-18.2	-5.5	-0.8	-0.2	2.3	6.1	7.0	6.4	6.9	8.2
2008									-10.6	-2.8	-1.6	1.7	6.2	7.2	6.5	7.0	8.4
2009										20.2	13.9	14.4	17.7	17.0	14.6	14.3	15.1
2010											8.3	10.8	15.8	15.3	12.9	12.7	13.8
2011												8.8	16.1	15.4	12.5	12.4	13.6
2012													23.8	20.2	15.2	14.5	15.7
2013														22.5	15.0	14.2	15.6
2014															7.3	8.8	11.8
2015																6.4	11.3
2016																	16.6

Sources: Real Estate Center at Texas A&M University and Dr. Aswarth Damodaran (New York University)

Table 3. Value of \$100,000 Home at Year-End

Year of Home Purchase (Beg. of Year)	In Dollars																
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
2000	113,156	117,164	120,770	124,026	129,482	136,772	143,812	146,476	146,684	144,807	142,782	144,942	151,518	162,556	174,870	188,473	203,585
2001		110,433	113,831	116,901	122,043	128,914	135,550	138,061	138,257	136,488	134,579	136,615	142,813	153,217	164,824	177,644	191,889
2002			106,729	109,606	114,428	120,870	127,092	129,446	129,630	127,971	126,181	128,091	133,902	143,657	154,539	166,560	179,915
2003				105,857	110,514	116,736	122,744	125,018	125,196	123,594	121,865	123,709	129,321	138,743	149,253	160,862	173,761
2004					107,214	113,250	119,080	121,286	121,458	119,904	118,226	120,015	125,460	134,600	144,797	156,059	168,573
2005						110,277	115,953	118,101	118,269	116,755	115,122	116,864	122,166	131,066	140,995	151,962	164,147
2006							111,067	113,124	113,285	111,835	110,271	111,940	117,018	125,543	135,053	145,558	157,230
2007								107,095	107,247	105,875	104,394	105,974	110,781	118,852	127,856	137,801	148,850
2008									101,997	100,692	99,283	100,786	105,358	113,034	121,597	131,055	141,563
2009										98,861	97,478	98,953	103,442	110,978	119,385	128,671	138,988
2010											97,340	98,813	103,296	110,821	119,216	128,489	138,792
2011												100,093	104,634	112,257	120,761	130,154	140,590
2012													106,119	113,850	122,474	132,001	142,585
2013														112,152	120,648	130,033	140,459
2014															115,412	124,390	134,364
2015																115,943	125,240
2016																	116,420

Sources: Real Estate Center at Texas A&M University and FHFA Home Price Index

+14.6 percent (Table 2). Higher growth in the initial years of a holding period effectively acts as a hedge against future market downturns.

Conversely, a portfolio opened in a year characterized by a stock market decline needs much higher growth in subsequent years to recoup the early losses during the initial years of the holding period. A stock portfolio opened in the beginning of 2002 earned an IRR of just +6.1 percent after five years (at the end of 2006). Return is significantly lower, as the average +0.1 percent IRR over 2002 and 2003 lessened the impact of subsequent stock market growth on the portfolio's value (Table 2).

How do the returns compare if both portfolios were sold at the end of 2008 during the early stages of the Great Recession (GR)? At +2.4 percent, the average IRR for a portfolio opened in 2003 remains slightly higher than the -1.5 percent IRR for a portfolio opened in 2002. The poor +0.1 percent average IRR over 2002 and 2003 diminished the ability of the portfolio opened in 2002 to offset the downturn in 2008. By comparison, the initial strong growth of +19.2 over 2003 and 2004 allowed the portfolio opened in 2003 to better offset the decline from the recession that began in 2008 (Table 2).

Home Purchase

Home values at the end of each year the home could have been sold, based on the year of purchase and Federal Housing Finance Agency (FHFA) home price appreciation data for Texas, are shown in Table 3. Table 4 shows the IRR based on those values.

Similar to renting and investing in the stock market, the return for a home purchase is affected by the timing of the initial investment and the duration of the holding period. While high market volatility significantly impacted the range of stock market investment returns, the low volatility in Texas' housing market tempered homeowners' returns.

Overall, lower volatility translated into much less IRR variation from homeownership than from the S&P 500 portfolio. Annual IRR ranged from -1.3 to +7.9 percent for a home purchase (Table 4) versus -18.2 to +23.8 percent for the stock market portfolio (Table 2). Thus, households had the potential to earn a significantly higher rate of return from the stock market than from owning a home. However, they also risked losing substantially more money. Both results rely heavily on the timing of the initial investment.

In the years immediately preceding the GR's housing downturn, the return on homeownership remained relatively unchanged. Unlike states such as California and Florida, Texas experienced neither excessively high home price appreciation during the national housing

boom of the mid-2000s nor the exceptional price decline immediately after the GR.

Since the GR, Texas home prices have increased more rapidly. For homes purchased from 2013 to 2016, the IRR from homeownership ranged from +5.9 to +7.9 percent (Table 4).

More Rewarding Investment?

Based on IRR, renting and investing in the stock market was generally the more financially rewarding option for a household between 2000 and 2016 in this first scenario (Table 5).

If the initial investment was made in 2000 or 2001, homeownership was, on average, the option that yielded a higher return through 2012. However, for all other years, on average, renting and investing in the stock market proved the more financially beneficial option.

Alternatively, the higher incidence of negative returns and greater return volatility experienced in the stock market indicates renters assumed much greater risk compared with buying a home. The IRR from a stock portfolio produced negative returns 23 times (Table 2). Meanwhile, IRR from homeownership produced negative returns in only six instances (Table 4).

Furthermore, the severity of the negative returns was much greater for an investment portfolio than for homeownership (-18.2 percent versus -1.3 percent). On average, the potential loss in initial investment proved higher

Table 4. IRR From Homeownership at Year-End

Year of Home Purchase (Beg. of Year)	Percent																
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
2000	6.4	5.4	4.8	4.4	4.4	4.6	4.6	4.3	3.9	3.4	3.0	2.9	3.0	3.3	3.6	3.8	4.0
2001		5.1	4.4	4.0	4.1	4.3	4.4	4.1	3.7	3.2	2.7	2.6	2.8	3.1	3.4	3.7	3.9
2002			3.3	3.1	3.4	3.9	4.1	3.8	3.3	2.8	2.4	2.3	2.5	2.8	3.2	3.5	3.7
2003				2.9	3.4	3.9	4.2	3.8	3.3	2.7	2.2	2.2	2.4	2.8	3.1	3.5	3.8
2004					3.5	4.2	4.5	3.9	3.3	2.6	2.1	2.0	2.3	2.7	3.1	3.5	3.8
2005						5.0	5.1	4.2	3.4	2.6	2.0	2.0	2.2	2.7	3.2	3.5	3.9
2006							5.4	4.2	3.2	2.3	1.6	1.6	2.0	2.6	3.1	3.5	3.8
2007								3.5	2.4	1.4	0.9	1.0	1.5	2.2	2.8	3.3	3.7
2008									1.0	0.2	-0.2	0.2	0.9	1.8	2.5	3.1	3.5
2009										-0.6	-0.8	-0.3	0.7	1.8	2.6	3.2	3.7
2010											-1.3	-0.4	0.8	2.1	3.0	3.6	4.2
2011												0.0	1.5	2.9	3.8	4.5	5.0
2012													3.0	4.4	5.2	5.7	6.1
2013														5.9	6.5	6.8	7.0
2014															7.4	7.5	7.7
2015																7.7	7.8
2016																	7.9

Sources: Real Estate Center at Texas A&M University and FHFA Home Price Index

Table 5. Investment Matrix to Purchase or Rent and Invest at Year-End

Year of Initial Investment or Purchase (Beg. of Year)	Percent																
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
2000	p	p	p	p	p	p	p	p	p	p	p	p	i	i	i	i	i
2001		p	p	p	p	p	p	p	p	p	p	p	i	i	i	i	i
2002			p	i	i	i	i	p	p	i	i	i	i	i	i	i	i
2003				i	i	i	i	p	i	i	i	i	i	i	i	i	i
2004					i	i	i	p	p	i	i	i	i	i	i	i	i
2005						i	i	p	p	i	i	i	i	i	i	i	i
2006							i	p	p	i	i	i	i	i	i	i	i
2007								p	p	p	p	i	i	i	i	i	i
2008									p	p	p	i	i	i	i	i	i
2009										i	i	i	i	i	i	i	i
2010											i	i	i	i	i	i	i
2011												i	i	i	i	i	i
2012													i	i	i	i	i
2013														i	i	i	i
2014															p	i	i
2015																p	i
2016																	i

Note: A “p” indicates that the IRR from homeownership was greater than from an S&P 500 stock portfolio. An “i” indicates that the IRR from an S&P 500 stock portfolio was greater than from homeownership.

Source: Real Estate Center at Texas A&M University

for renters than for homeowners. The IRR from the stock portfolio varied significantly across holding periods, whereas the IRR from homeownership remained in the low single digits.

Note that the analysis for renters who chose to invest in the stock market portfolio reflects before-tax returns. Capital gains tax is not factored into the returns for the stock market or homeownership in this first scenario.

According to the Tax Policy Center, the average effective tax rate for capital gains ranged from a low of 12.5 percent in 2009 to a high of 19 percent in 2000. This represents a significant portion of the overall value of the stock portfolio and would have a large impact on its after-tax return.

Weighing the Options

On average, renting and investing in the stock market offered a greater IRR than purchasing a home for Texas households from 2000 to 2017 under this first set of assumptions. However, the introduction of capital gains tax can affect the investment decision. Under current tax law, avoiding capital gains tax on sale of a home gives homeownership a tremendous edge. The impact of both capital gains tax and transaction costs is introduced in a second scenario.

Scenario 2: A More “Real-World” Comparison

This scenario considers the IRR from homeownership across four major Texas MSAs along with the State of Texas. The four metros discussed are Austin, Dallas-Fort Worth, Houston, and San Antonio.

Like Scenario 1, Scenario 2 compares the IRR from homeownership to that from renting and investing in the stock market. However, it also considers expenses associated with buying, holding, and selling a home or a stock portfolio in a typical, real-world situation. The amount of the initial investment varies, but it is assumed to be the same for both investment options.

Home Purchase Assumptions

A few assumptions are changed for this second scenario.

- The sum of the down payment on a home plus the closing costs represents the initial investment. The down payment for a home purchase is 20 percent.
- The dollar amount available to either purchase or rent varies by the five geographies and year of investment due to changes in median home prices.
- According to the U.S. Census Bureau, 58 percent of the total owner-occupied housing units in Texas were mortgaged in 2016. This analysis assumes

households require a mortgage and must pay principal and interest.

- Homeowners must also pay property taxes, insurance, and maintenance costs.
- Both homeowners and renters pay for utilities separately. Therefore, utilities are a wash, and this analysis does not consider them.
- Because this analysis assumes a minimum two-year holding period for a principal residence, no capital gains tax on a sale by homeowners is factored in.
- A 30-year, fixed-rate mortgage at the effective mortgage interest rate was calculated for each geography. However, mortgage interest rates vary

slightly by Metropolitan Statistical Area (MSA). For the state, the rate ranged from a low of 3.75 percent in 2012 to a high of 8.16 percent in 2000. FHFA is the source for mortgage interest rate data.

- Closing costs are 2 percent of the purchase price.
- Selling fees are 6 percent of the sales price.
- Property taxes are pegged at 2 percent of the home value while insurance and maintenance costs are 1.5 percent.
- Homeowner net cash flows equal the outflow of mortgage principal and interest, property taxes, and insurance and maintenance plus the inflow of rent on a “comparable” property.

Using IRR as a Benchmark

The IRR provides a direct numerical comparison between renting and investing the difference in a stock portfolio and purchasing a home. According to Property Metrics, the IRR “is the percentage rate earned on each dollar invested for each period it is invested.” While the two options share the same initial investment, the end-values may differ depending on the holding period, producing different IRRs.

A household’s decision to rent and invest the difference in the stock market or purchase a home is displayed in the investment values and IRR at the end of each holding period. Holding periods range from a minimum of two years to a maximum of 18 (for a household that invests as early as the beginning of 2000 and sells as late as the end of 2017). This results in a total of 153 holding periods to be analyzed.

Scenario 1

The first scenario excludes all expenses accrued from opening and selling a stock portfolio while renting or from buying, holding, and selling a home. Assuming all other factors are fixed, this scenario offers a simple, straightforward comparison between the two options. Ups and downs in the stock market and Texas housing market have not coincided since 2000.

In fact, dramatic differences in magnitude of change and timing have often resulted in a large variation in the two investments’ return. Consequently, the variation has also affected the winning investment decision for any given holding period.

For this analysis, the S&P 500 represents the performance of the stock market. History shows the stock market is generally more volatile than the housing market. The annual returns for the S&P 500, which include dividends and exclude the impact of capital gains tax, ranged from –36.6 percent in 2008 to +32.1 percent in 2013 (see table).

Scenario 2

Scenario 2 adds to the complexity of the model by replicating more real-world conditions. The dollar amount of the initial investment varies by the five different geographies and year of investment based on changes in median home prices. For example, in Austin the initial investment for both options at the beginning of year 2000 equals \$41,560 but increases to \$57,927 by the beginning of 2016.

In regard to capital gains tax treatment, data for the average effective long-term capital gains tax rate from 2000 to 2014 was obtained from the Tax Policy Center. The 2014 rate is held constant across 2015, 2016, and

2017. Passage of the Taxpayer Relief Act in 1997 enabled households to avoid capital gains tax as long as the home has been owner-occupied for at least two of the last five years and the gain on sale is \$500,000 or less (\$250,000 or less for single filers). Although capital gains tax is not considered for homeowners, it is taken out of a renter's stock portfolio gains.

Annual Return from S&P 500 vs Annual Home Price Appreciation for Texas

Year	S&P 500 (percent)	Texas (percent)
2000	-9.0	6.1
2001	-11.8	6.7
2002	-22.0	3.5
2003	28.4	3.1
2004	10.7	2.7
2005	4.8	4.4
2006	15.6	5.6
2007	5.5	5.1
2008	-36.6	1.9
2009	25.9	0.1
2010	14.8	-1.3
2011	2.1	-1.4
2012	15.9	1.5
2013	32.1	4.5
2014	13.5	7.3
2015	1.4	7.6
2016	11.8	7.8
2017	21.6	8.2

Sources: Dr. Aswath Damodaran (New York University) and the Federal Housing Finance Agency (FHFA)

These additional assumptions are intended to represent reasonable estimates of actual market conditions. Different loan terms or expenses associated with homeownership can alter the return on homeownership and potentially reverse the investment decision.

Renter Stock Portfolio Assumptions

Stock portfolio expenses paid by renters typically include purchase and sale broker commissions (i.e., transaction fees) as well as capital gains tax on the sale of individual stocks or the portfolio itself. Assumptions for this scenario:

- As in Scenario 1, the renter household does not make any transactions over the holding period of the investment portfolio.
- As stock transaction fees are generally quite low (1 percent or less), they are excluded from the analysis.
- Scenario 2 factors in capital gains tax on a stock portfolio, with the rate being 12.5 to 19 percent of the overall value of the portfolio, depending on tax law at the time.
- Since a renter household does not make any transactions over the holding period of the portfolio, the tax is applied to the value of the stock portfolio only when it's liquidated—as long as the portfolio realizes a gain in value.
- If the portfolio loses value over its holding period, renter households are not subject to capital gains tax on the sale of the portfolio.

Rental Property Assumptions

For households choosing to rent and invest in the stock portfolio, the following assumptions apply:

- Monthly rent is the sole cash outflow for renters. No utilities are considered.
- The rental property is comparable in quality and functionality to one a homeowner would purchase.
- Annual cash inflows to renters are the annual expenses associated with homeownership offset by the difference between owning and renting.
- A household that rents and decides to open a stock portfolio reinvests the difference between owning and renting. (Actual renters often lack the discipline to actually deposit such funds into a stock portfolio each month. This study assumes a disciplined investor.)

No rental rate index for the five specific geographies was available. Therefore, annual rents were calculated by adjusting the 2015 median rent for each geography reported in the American Community Survey by the annual consumer price index reported by the U.S. Bureau of Labor Statistics.

Cash-Flow Fluctuations

Net cash flow to homeowners is typically negative, as the annual costs of homeownership usually outweigh the rent on a “comparable” property. However, upward pressure on rents has translated into positive cash flows for homeownership over the past several years.

Rental rates in some Texas metros have been also quite volatile. For example, from 2000 to 2017 Dallas-Fort Worth rent growth ranged from -2.9 percent to +7.0 percent, averaging +3.1 percent each year. Meanwhile, the annual cash outflows associated with homeownership in DFW increased, on average, 1.6 percent each year.

Purchasing a home in 2016 in DFW would have resulted in a negative cash flow for the first year (-\$264.48) but a positive cash flow for the second year (+\$141.30), as annual average rent exceeded the annual average costs of homeownership. In essence, rent growth outpaced the growth in homeownership costs between 2016 and 2017.

Homeownership costs tended to remain more stable than rental rates over the holding periods, as the sum of principal and interest is constant for a fixed-rate mortgage. Property taxes and insurance and maintenance can vary each year depending on factors such as the appraised value of the home. However, the sum of these expenses was generally less than the sum of mortgage principal and interest, thus having less impact on overall homeownership costs.

Scenario 2 Results

Even if a household suffered an overall financial loss from a particular investment (as indicated by a negative IRR), the investment with the less negative IRR is assumed to provide the household with greater financial gain. In other words, a superior IRR does not necessarily translate into a positive IRR.

The results for the investment decision (i.e., the number of times a household most often captured a higher IRR from purchasing a home or renting and investing in the stock market during the study period) vary by geography. However, the IRRs from homeownership exceeded the IRRs from renters investing in the stock market in all five MSAs and Texas overall.

The Winning IRR Tally

Of the four major MSAs, Austin had the most occurrences of an IRR that was greater for homeownership. Over the study's 153 individual holding periods, the IRR for homeownership exceeded that from renters investing in the stock market 130 times, or 85 percent of the time (Table 6).

In DFW, the IRR from homeownership surpassed that of renters investing in the stock market 82 times, or 53.6 percent of the time (Table 7). In Houston, the frequency was 121 times, or 79.1 percent (Table 8), and in San Antonio, 113 times, or 73.9 percent (Table 9).

Results using statewide median home price appreciation are in Tables 10 and 11. The IRR from homeownership in Texas surpassed that of renters investing in the stock market 97 times, or 63.4 percent of the time, suggesting that home price increases in the state's four major metros have generally been stronger than in less urban areas.

Incidence of Positive versus Negative IRRs

The results also indicate that either renting and investing in the stock market or buying a home would have produced more positive than negative returns. However, homeownership did result in a greater incidence of positive returns in every case.

In Austin, the IRR from homeownership was positive in 133 instances, or 86.9 percent of the time (Table 12). DFW had 116 occasions, or 75.8 percent (Table 13); Houston 134, or 80 percent (Table 14); and San Antonio 127, or 83 percent (Table 15). Statewide, the homeownership IRR was positive 126 times, or 82.4 percent of the time (Table 10).

The IRR from renters investing in the stock market was the same regardless of geography, with a positive IRR occurring in 113 instances, or 73.9 percent of the time (Table 16).

When Renting and Investing in Stock Market Paid Off

In Austin, the instances in which renters investing in the stock market provided a superior IRR to purchasing a home are characterized by a shorter investment horizon (between one and five years). For example, a household that invested in the beginning of 2003 would have witnessed greater financial gain by renting and investing in the stock market if the household had disinvested in the first four holding periods (at the end of 2004, 2005, 2006, and 2007) (Table 6).

For households that invested from 2011 onward and disinvested from 2013 to 2017, the return on homeownership measured significantly higher than the return on a renter's investment portfolio (Table 6). This is largely a

Table 6. Investment Matrix to Purchase or Rent and Invest at Year-End for Austin

Year of Initial Investment or Purchase (Beg. of Year)	Percent																
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
2000	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p
2001		p	i	p	p	p	p	p	p	p	p	p	p	p	p	p	p
2002			i	i	i	i	p	p	p	p	p	p	p	p	p	p	p
2003				i	i	i	i	p	p	p	p	p	p	p	p	p	p
2004					i	p	p	p	p	p	p	p	p	p	p	p	p
2005						p	p	p	p	p	p	p	p	p	p	p	p
2006							p	p	p	p	p	p	p	p	p	p	p
2007								p	p	p	i	p	p	p	p	p	p
2008									i	i	i	p	p	p	p	p	p
2009										i	i	i	i	i	p	p	p
2010											i	i	i	p	p	p	p
2011												i	p	p	p	p	p
2012													p	p	p	p	p
2013														p	p	p	p
2014															p	p	p
2015																p	p
2016																	p

Note: A "p" indicates that the IRR from homeownership was greater than from an S&P 500 stock portfolio.

An "i" indicates that the IRR from an S&P 500 stock portfolio was greater than from homeownership.

Source: Real Estate Center at Texas A&M University

Table 7. Investment Matrix to Purchase or Rent and Invest at Year-End for DFW

Year of Initial Investment or Purchase (Beg. of Year)	Percent																
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
2000	p	p	p	p	p	p	p	p	p	p	p	i	i	p	p	p	p
2001		p	p	p	p	p	p	p	p	p	i	i	i	p	p	p	p
2002			i	i	i	i	i	p	p	i	i	i	i	i	p	p	p
2003				i	i	i	i	p	i	i	i	i	i	i	i	p	p
2004					i	i	i	p	p	i	i	i	i	i	p	p	p
2005						i	i	p	p	p	i	i	i	p	p	p	p
2006							i	p	i	i	i	i	i	i	p	p	p
2007								p	i	i	i	i	i	i	p	p	p
2008									i	i	i	i	i	i	p	p	p
2009										i	i	i	i	i	i	p	p
2010											i	i	i	i	p	p	p
2011												i	i	p	p	p	p
2012													i	p	p	p	p
2013														p	p	p	p
2014															p	p	p
2015																p	p
2016																	p

Note: A “p” indicates that the IRR from homeownership was greater than from an S&P 500 stock portfolio. An “i” indicates that the IRR from an S&P 500 stock portfolio was greater than from homeownership.

Source: Real Estate Center at Texas A&M University

Table 8. Investment Matrix to Purchase or Rent and Invest at Year-End for Houston

Year of Initial Investment or Purchase (Beg. of Year)	Percent																
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
2000	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p
2001		p	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p
2002			p	p	p	p	p	p	p	p	p	p	p	p	p	p	p
2003				i	i	i	p	p	p	p	p	p	i	p	p	p	p
2004					i	p	p	p	p	p	p	p	p	p	p	p	p
2005						p	p	p	p	p	p	p	p	p	p	p	p
2006							i	p	p	p	i	i	i	p	p	p	p
2007								p	p	i	i	i	i	p	p	p	p
2008									i	i	i	i	i	p	p	p	p
2009										i	i	i	i	i	i	p	i
2010											i	i	i	i	p	p	p
2011												i	i	p	p	p	p
2012													i	p	p	p	p
2013														p	p	p	p
2014															p	p	p
2015																p	p
2016																	p

Note: A “p” indicates that the IRR from homeownership was greater than from an S&P 500 stock portfolio. An “i” indicates that the IRR from an S&P 500 stock portfolio was greater than from homeownership.

Source: Real Estate Center at Texas A&M University

result of substantially higher returns on homeownership within that period compared with previous periods.

From 2000 to 2017, homeownership in DFW provided, on average, only slightly greater financial gain than renters investing in the stock market. Compared with the other three major metros and the state, DFW

homeownership returned the fewest incidences of superior IRR (Table 7).

Renters investing in the stock market produced a higher IRR for a household making the initial investment between 2002 and 2004 or between 2006 and 2010. Irrespective of the year of initial investment, investing

in the stock market generally provided greater financial gain for a household that disinvested between 2005 and 2007 or between 2010 and 2014. However, disinvestment since 2015 would have resulted in homeownership providing the superior IRR.

The disparity in IRR between renters investing in the stock market and buying a home in the DFW market

has widened significantly in the last several years. For a household choosing the home purchase option in 2014 through 2016, the IRR would have ranged between +25.1 percent and +32.0 percent (Table 13).

Overall, from 2000 to 2017 homeownership in Houston proved more financially beneficial than renting and investing in the stock market (Table 8). However,

Table 9. Investment Matrix to Purchase or Rent and Invest at Year-End for San Antonio

Year of Initial Investment or Purchase (Beg. of Year)	Percent																
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
2000	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p
2001		p	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p
2002			p	p	p	p	p	p	p	p	p	p	i	i	p	p	p
2003				i	i	p	p	p	p	p	p	p	i	i	p	p	i
2004					p	p	p	p	p	p	p	p	p	p	p	p	p
2005						p	p	p	p	p	p	p	p	p	p	p	p
2006							p	p	p	p	p	i	i	i	p	p	p
2007								p	p	i	i	i	i	i	p	p	p
2008									i	i	i	i	i	i	p	p	p
2009										i	i	i	i	i	i	i	i
2010											i	i	i	i	i	p	p
2011												i	i	i	p	p	p
2012													i	i	p	p	p
2013														i	p	p	p
2014															p	p	p
2015																p	p
2016																	p

Note: A “p” indicates that the IRR from homeownership was greater than from an S&P 500 stock portfolio. An “i” indicates that the IRR from an S&P 500 stock portfolio was greater than from homeownership.

Source: Real Estate Center at Texas A&M University

Table 10. IRR from Homeownership at Year-End for Texas

Year of Home Purchase (Beg. of Year)	Percent																
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
2000	0.3	2.6	3.1	2.9	3.7	4.7	5.2	4.6	3.6	2.5	1.6	1.6	2.3	3.2	4.0	4.7	4.4
2001		-1.4	1.8	2.6	4.2	5.8	6.5	5.8	4.8	3.6	2.6	2.7	3.4	4.4	5.2	5.8	5.5
2002			-8.3	-3.2	0.9	4.1	5.6	5.1	4.1	2.8	1.9	2.1	3.0	4.2	5.2	5.9	5.6
2003				-7.7	0.6	5.4	7.5	6.9	5.8	4.4	3.4	3.6	4.6	5.8	6.8	7.5	7.1
2004					-4.7	4.3	7.7	7.2	6.0	4.4	3.3	3.7	4.9	6.3	7.4	8.2	7.8
2005						1.7	7.6	7.2	5.8	4.0	2.8	3.4	4.8	6.6	7.8	8.7	8.3
2006							0.8	2.2	1.3	-0.4	-1.5	-0.3	2.0	4.5	6.3	7.5	7.1
2007								-6.6	-4.6	-5.4	-5.7	-3.3	0.2	3.6	5.9	7.5	7.1
2008									-16.9	-14.1	-12.6	-7.8	-2.5	2.3	5.4	7.5	7.0
2009										-21.3	-16.1	-8.6	-1.5	4.2	7.7	9.9	9.2
2010											-23.7	-11.3	-1.4	5.8	9.8	12.1	11.2
2011												-14.9	-0.8	8.1	12.5	14.8	13.3
2012													1.6	13.1	17.5	19.4	16.9
2013														12.8	19.5	21.6	18.0
2014															17.9	22.3	17.4
2015																19.8	14.8
2016																	5.1

Sources: Real Estate Center at Texas A&M University and FHFA Home Price Index

on average, renters investing in the stock market did provide a superior IRR to purchasing a home for households that invested from 2008 to 2010.

Houston homeownership consistently posted double-digit returns for households that invested between 2013 and 2015. For a household that invested in 2014, the IRR from homeownership would have been +25.9 percent,

+23.3 percent, or +22.1 percent, depending on year of disinvestment (Table 14).

Similar to Houston, from 2000 to 2017 San Antonio homeownership produced, on average, greater financial gain than renters investing in the stock market. However, the stock market did provide a superior IRR to renters investing from 2008 to 2010 (Table 9).

Table 11. Investment Matrix to Purchase or Rent and Invest at Year-End for Texas

Year of Initial Investment or Purchase (Beg. of Year)	Percent																
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
2000	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p
2001		p	p	p	p	p	p	p	p	p	p	i	i	p	p	p	p
2002			i	i	p	p	p	p	p	p	p	i	i	i	p	p	i
2003				i	i	i	i	p	p	i	i	i	i	i	i	p	i
2004					i	i	p	p	p	p	p	p	i	p	p	p	p
2005						i	p	p	p	p	p	p	p	p	p	p	p
2006							i	p	p	p	i	i	i	i	p	p	p
2007								p	p	i	i	i	i	i	p	p	p
2008									i	i	i	i	i	i	p	p	p
2009										i	i	i	i	i	i	i	i
2010											i	i	i	i	p	p	p
2011												i	i	i	p	p	p
2012													i	p	p	p	p
2013														p	p	p	p
2014															p	p	p
2015																p	p
2016																	i

Note: A “p” indicates that the IRR from homeownership was greater than from an S&P 500 stock portfolio. An “i” indicates that the IRR from an S&P 500 stock portfolio was greater than from homeownership.

Source: Real Estate Center at Texas A&M University

Table 12. IRR from Homeownership at Year-End for Austin

Year of Home Purchase (Beg. of Year)	Percent																
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
2000	18.4	10.7	6.6	4.1	4.8	6.6	7.9	7.5	5.8	4.4	3.3	4.4	5.2	6.2	6.8	7.2	7.4
2001		-0.8	-0.9	-1.2	1.9	5.4	7.8	7.6	6.0	4.6	3.6	4.9	5.9	7.1	7.7	8.1	8.3
2002			-18.3	-12.5	-4.7	2.0	6.1	6.4	4.8	3.5	2.5	4.4	5.6	7.1	7.8	8.3	8.6
2003				-17.0	-4.3	4.5	9.2	9.4	7.3	5.7	4.5	6.4	7.6	9.0	9.7	10.1	10.2
2004					-7.7	5.6	11.7	11.4	8.7	6.7	5.3	7.3	8.6	10.1	10.8	11.2	11.3
2005						7.4	15.4	14.1	10.2	7.5	5.7	8.1	9.5	11.1	11.8	12.1	12.2
2006							13.1	12.2	7.3	4.2	2.4	5.8	7.9	10.1	11.0	11.5	11.7
2007								5.8	1.6	-0.7	-1.9	3.7	6.9	9.8	11.2	11.8	12.1
2008									-14.6	-12.4	-10.9	-0.7	4.7	9.0	11.0	12.0	12.4
2009										-23.7	-17.4	-1.6	5.9	11.2	13.4	14.5	14.8
2010											-22.9	-0.4	8.9	14.9	16.9	17.7	17.7
2011												0.9	13.0	19.7	21.3	21.4	20.9
2012													22.8	29.1	28.8	27.4	25.7
2013														28.2	30.0	28.9	27.0
2014															29.6	29.8	27.9
2015																25.9	27.1
2016																	23.1

Sources: Real Estate Center at Texas A&M University and FHFA Home Price Index

Regardless of the year of initial investment, the IRR on homeownership overwhelmingly outpaced that of the stock market for households that disinvested from 2015 to 2017 (Table 9). The larger disparity in the IRR between investment options is a factor of both home price appreciation and growth in rent above the costs of homeownership.

Across Texas, from 2000 to 2017 homeownership yielded an IRR superior to renters investing in the stock market. Furthermore, above-average home price appreciation

from 2013 to 2015 facilitated significantly higher returns from homeownership (Table 11).

Overall Conclusions

Scenarios 1 and 2 yield vastly different results. Scenario 1 found that renting and investing in the stock market was, on average, the option that offered a greater IRR for households in Texas from 2000 to 2017. Conversely, using home price appreciation from the four major Texas MSAs as well as the state, Scenario 2 revealed that

Table 13. IRR from Homeownership at Year-End for DFW

Year of Home Purchase (Beg. of Year)	Percent																
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
2000	1.5	3.9	3.7	3.0	3.1	3.1	3.2	2.7	1.9	1.1	0.2	0.4	1.5	2.9	4.0	5.0	5.9
2001		-0.6	1.8	2.1	2.9	3.4	3.7	3.3	2.6	1.7	0.8	1.1	2.3	3.8	5.0	6.0	6.9
2002			-8.7	-4.3	-1.1	0.6	1.8	1.6	1.1	0.3	-0.5	0.0	1.6	3.4	4.9	6.1	7.0
2003				-9.7	-2.5	0.9	2.8	2.9	2.5	1.7	0.9	1.5	3.2	5.1	6.6	7.7	8.7
2004					-8.8	-1.8	1.6	2.2	1.9	1.2	0.4	1.2	3.3	5.5	7.2	8.4	9.5
2005						-6.5	0.0	1.3	1.2	0.5	-0.4	0.8	3.3	5.9	7.8	9.2	10.3
2006							-9.2	-5.1	-4.1	-4.5	-5.2	-3.2	0.4	3.9	6.4	8.2	9.6
2007								-13.0	-9.2	-8.7	-9.0	-5.9	-1.0	3.4	6.4	8.5	10.1
2008									-19.7	-16.0	-15.0	-10.0	-3.2	2.7	6.4	8.9	10.7
2009										-21.9	-17.8	-10.2	-1.7	5.1	9.1	11.7	13.4
2010											-25.5	-13.1	-1.5	6.8	11.5	14.2	15.9
2011												-17.3	-0.7	9.6	14.7	17.4	19.0
2012													3.0	15.7	20.7	22.8	23.7
2013														18.0	24.6	26.5	27.1
2014															25.1	28.9	29.7
2015																28.6	32.0
2016																	31.9

Sources: Real Estate Center at Texas A&M University and FHFA Home Price Index

Table 14. IRR from Homeownership at Year-End for Houston

Year of Home Purchase (Beg. of Year)	Percent																
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
2000	2.1	4.6	5.4	5.8	6.4	7.2	7.2	6.7	5.8	4.7	3.7	3.9	4.6	5.8	6.4	6.5	6.6
2001		0.2	4.2	5.8	7.1	8.3	8.6	8.0	7.0	5.8	4.8	5.0	5.7	7.0	7.6	7.7	7.8
2002			-4.7	1.3	4.8	7.3	8.0	7.7	6.7	5.4	4.3	4.7	5.6	7.1	7.8	7.9	8.1
2003				-2.7	4.4	8.5	9.6	9.2	8.1	6.6	5.5	5.9	6.9	8.4	9.1	9.2	9.3
2004					-1.5	6.6	8.8	8.7	7.4	5.8	4.6	5.2	6.5	8.4	9.3	9.4	9.5
2005						2.6	7.5	7.9	6.6	4.8	3.5	4.5	6.2	8.4	9.5	9.6	9.8
2006							0.0	2.8	2.1	0.4	-0.7	1.0	3.6	6.7	8.2	8.5	8.8
2007								-5.7	-3.5	-4.2	-4.7	-1.5	2.3	6.4	8.3	8.7	9.1
2008									-13.3	-11.0	-9.9	-4.6	0.9	6.3	8.7	9.2	9.8
2009										-19.2	-14.3	-5.8	1.7	8.3	11.0	11.5	12.0
2010											-23.1	-8.8	1.7	10.0	13.0	13.4	13.8
2011												-11.6	3.3	13.5	16.6	16.5	16.4
2012													7.9	20.7	23.0	21.6	20.7
2013														22.6	25.8	23.4	22.0
2014															25.9	23.3	22.1
2015																15.2	18.3
2016																	9.6

Sources: Real Estate Center at Texas A&M University and FHFA Home Price Index

Table 15. IRR from Homeownership at Year-End for San Antonio

Year of Home Purchase (Beg. of Year)	Percent																
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
2000	-8.0	-1.7	1.6	3.1	5.4	7.2	8.0	6.6	5.4	3.9	3.1	2.9	2.9	3.6	4.2	4.7	5.3
2001		-3.1	2.7	4.9	7.8	9.8	10.5	8.7	7.3	5.5	4.6	4.3	4.3	4.9	5.5	6.0	6.5
2002			-4.0	1.9	7.0	10.0	11.1	8.9	7.3	5.4	4.4	4.2	4.2	4.9	5.7	6.2	6.7
2003				-0.8	8.4	12.7	13.9	11.3	9.3	7.1	6.0	5.7	5.7	6.4	7.2	7.7	8.2
2004					5.1	13.2	15.3	12.0	9.8	7.2	6.1	5.9	6.0	6.9	7.7	8.3	8.9
2005						13.0	16.9	12.4	9.8	6.7	5.6	5.6	5.8	6.9	8.0	8.7	9.3
2006							11.0	6.8	4.7	1.7	1.0	1.7	2.6	4.4	6.1	7.2	8.1
2007								-4.1	-2.7	-4.8	-4.1	-2.0	-0.1	2.8	5.2	6.7	8.0
2008									-18.9	-16.9	-12.8	-8.0	-4.2	0.4	4.0	6.1	7.8
2009										-22.6	-14.6	-7.6	-2.7	2.6	6.4	8.6	10.3
2010											-22.2	-10.3	-3.2	3.6	8.2	10.6	12.3
2011												-11.9	-2.2	5.9	10.9	13.2	14.8
2012													-3.1	8.7	14.6	16.9	18.3
2013														5.5	15.1	18.1	19.8
2014															14.4	19.2	21.4
2015																17.1	22.3
2016																	18.8

Sources: Real Estate Center at Texas A&M University and FHFA Home Price Index

Table 16. IRR from S&P Stock Portfolio After Tax at Year-End

Year of Initial Investment (Beg. of Year)	Percent																
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
2000	-10.5	-14.5	-5.3	-2.3	-1.2	-1.1	-0.3	-3.6	-1.0	-0.9	-0.7	0.5	2.1	2.8	2.7	3.2	4.1
2001		-4.1	-0.6	-2.5	0.3	1.0	-2.9	0.0	0.0	0.1	1.3	3.0	3.7	3.5	4.0	5.0	0.0
2002			-7.8	-1.6	-0.1	2.9	3.3	-1.5	-0.1	1.4	1.4	2.6	4.3	5.0	4.7	5.2	6.1
2003				10.4	8.5	10.3	9.3	0.0	3.5	4.8	4.4	5.5	7.1	7.6	7.1	7.4	8.3
2004					-0.2	4.8	5.0	-2.1	-0.2	1.8	1.7	3.2	5.2	5.9	5.5	6.0	7.0
2005						2.0	3.1	-5.1	-2.2	0.3	0.5	2.3	4.6	5.4	5.0	5.6	6.7
2006							2.3	-8.2	-0.6	-0.5	-0.2	1.9	4.5	5.5	5.0	5.6	6.9
2007								-18.2	-5.5	-0.8	-0.2	-0.2	3.0	4.2	3.9	4.7	6.1
2008									-10.6	-2.8	-1.6	-1.3	2.6	4.1	3.7	4.6	6.2
2009										12.2	8.5	10.3	13.0	13.0	11.3	11.3	12.4
2010											0.8	5.5	10.0	10.6	9.0	9.4	10.9
2011												1.1	8.4	9.6	7.9	8.5	10.3
2012													11.7	12.2	9.4	9.9	11.7
2013														10.4	7.3	8.4	10.9
2014															-3.3	1.5	6.2
2015																-4.1	3.8
2016																	5.1

Sources: Real Estate Center at Texas A&M University and FHFA Home Price Index

purchasing a home generally provided households with a superior IRR.

A major factor in the different outcomes between scenarios was the effect of capital gains tax on a renter’s investment portfolio. The introduction of capital gains tax in Scenario 2 dramatically impacted the IRR from an investment portfolio. In most cases under current tax law, avoiding paying capital gains tax on the sale of a home gives homeownership a tremendous edge.

Additionally, high rent growth over the past several years has diminished the financial gain from investing

any excess funds in the stock market. Across the four major MSAs, rent on a “comparable” property typically outweighed the annual costs of homeownership by the end of any given holding period.

An important factor to consider is the substantial up-front cost of purchasing a home versus renting and investing in the stock market. Potential homeowners should typically expect to remain in a home at least two years before the front-end costs are recouped.

Finally, renters investing in the stock market at the end of a recession and disinvesting within a few years almost

always captured the superior financial investment. The stock market tends to grow at a much faster rate than home prices coming out of a recession. However, over longer time periods purchasing a home has shown to be the winner.

Ultimately, a household's decision to rent and invest in the stock market or purchase a home will be determined by a combination of these and other factors. This analysis considered only the IRR a household would have received from either investment option.

Likewise, a household's decision to rent and invest in the stock market or purchase a home will be determined by a combination of personal and investment preferences,

not just the IRR the household would have received from either option. Households are likely to consider factors such as each market's historic performance and its current conditions, and the ease and ability of qualifying for homeownership.

Other factors include the need for flexibility in living arrangements, the obligations of homeownership, available housing stock, nearby amenities, and the social and community aspects of owning versus renting. ➤

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